Reviewer’s report

Title: The association between tuberculin skin test result and active tuberculosis risk of college students in Beijing, China: a retrospective cohort study

Version: 0 Date: 04 May 2019

Reviewer: Sheng-Wei Pan

Reviewer's report:

This large-scale retrospective cohort study investigated the predictive value of TST on the risk of active TB in college students in China (n=67,428, aged 17-21 years). The study disclosed that active TB risk significantly increased by about 3 times per 5 mm increasing in TST size compared with reaction size ≤5-10 mm, up to 9.8-fold with reaction size ≥20 mm. In addition, the adjusted HR of active TB was 3.6 (1.4~9.5) of males compared to females. The authors provided explanation on this gender difference in this specific population going through puberty. The authors also clearly stated the limitations of this study which included uncontrolled potential confounders (smoking status, TB contact history). In general, this study is well conducted and may provide important information on the value of TST for predicting high TB-risk college students before providing IGRA tests in less developed areas.

Listed below are some comments.
1. Title: may change "a retrospective study" to "a retrospective cohort study".
2. In Abstract, last 3 lines, and Conclusions (first 2 lines): the authors stated that "the risk of active TB increased rapidly in college students when the TST reaction size was ≥10 mm, particularly in males". However, there is no data on dose-response relationship between TST size and TB risk for male and female population, respectively. I suggest the authors to perform a subgroup subgroups analysis and to present the results before making this conclusion.
3. Methods, statistical analysis: I suggest the author to delete "with a backward selection process" if this was not used in this study.
4. Results, first 2-3 lines: In order to better understand the demographic background of this study, I suggest the authors to remove "(excluded the records of Hong Kong, Macao, Taiwan and overseas)" and replaced it by "including A province (N1, %), B province (N2, %), C province (N3, %), …. (the major 3-5 contributing provinces or areas).
5. Results, page 5: should correct three typos, including (1) However, "No" significant, (2) per "10000 persone-years", (3) P = "9.451e-07".
6. Results, Table1: I suggest the authors to change the item from "PR (active TB)" to "number of active TB at screening" to simplify the presentation since prevalence rate of active TB is not the key issue of this study.
7. Results, Figure 1: Regarding the hazard of active TB between subgroups, I think the information shown in Fig 1 have been clearly presented in Table 2. Hence, the author may consider to change Fig 1’s demonstration from "cumulative hazard" to "cumulative incidence" by using Kaplan-Meier method.
8. Results, Table 2: I suggest the authors to delete the "Follow-up" item and replace it by (n=xx) for each subgroup. More importantly, for this cohort study, the author should add data on "TB events/follow-up person-years" in this table before presenting the corresponding incidence rates. In addition, why not age, BMI and comorbidity be included in the models? Those are risk factors for active TB disease and should be adjusted in analysis.

9. Finally, it would be interesting to compare the characteristic of students with TST positive versus TST negative. Are the two groups different in their sex percentage, BMI, BCG status, ethnicity, region or comorbidity? Furthermore, is there a synergistic effect of male sex, low BMI and TST positive on the risk of active TB in the college students? That information may be helpful if we want to construct a further TST-base TB screening strategy for college student in areas where IGRA is not feasible.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

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Please indicate the quality of language in the manuscript:

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